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A Review Study of *Sandi Sharir* Colleration with Modern

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Abstract: ***We have evolved our way of life on the "art of locomotion." We move on our joints, which are well-supported by soft tissues like muscles, ligaments, and tendons. Without the ability to move, life would not have been easy. Our living movements are made possible by the flexibility and vast array of movements that are specialized and programmed differently in various bone joints. The key to success and advancement is movement, and our body's joints are the key to movement.***
Many vedic, ayurveda, and non-ayurvedic texts have used synonyms for sandhi, such as sangama, samyoga, and sammilana. This indicates that sandhi is the articulation or junction of two or more structures. A joint, in the modern sense, is a location where two or more bones articulate with one another. Joints come in a range of shapes and purposes. They are designed to accommodate a variety of movement types and degrees, including flexion, extension, adduction, and abduction. Similar to Sushruta Samhita, joints are classified as either immovable (sthira) or mobile (chestavant sandhi) in the current day. It was then separated into eight categories once more. There is consistency in the types, locations, and composition of joints between Sushruta Samhita and current anatomy, however the numerical differences are merely noticeable.
Modern anatomy describes 360 joints however the Sushruta Samhita describes 210 sandhis. Acharya Sushruta has identified the precise names of 210 joints but not their locations. I coordinated the sandhis with the modalities of 210 for this research report, and only their names were provided based on their precise position.
Keywords: Sandhi, Sammilana, Samyoga.

I. INTRODUCTION

The oldest medical science that addresses both physical and mental well-being in humans is Ayurveda. According to Atreya, Dhanvantari, and all other cultures, understanding the body is crucial for knowledge's sake in Ayurvedic literature. According to *Sabdakalpadhruma* the word sandhi is derived from *sam* + *dha* + ki *pratyay* means *samyoga* or articulation. According to the father of Medicine Acharya Charak "*Ashthi sanyoga* sthanam" means meeting place between two or more bones called sandhi. According to *Sushruta* father of surgery the term sandhi *sharir* means the study of joints not only bony joints but any places where *pesi* (muscles), *snayu* (ligaments), *siras* (veins) etc are associated or meeting with each other. The term sandhi means *samyoga* or junction or meeting place or association. According to Acharya Sushruta Sandhi only *Asthi* sandhi should be taken into account where as sandhi of *pesi* (muscle) *snayu* (ligaments), *siras* (veins) etc are innumerable and should be excluded while counting. Thus sandhi or joint are the junction between two or more bone or cartilages. It is device to permit movements. According to other opinions like as *sharangadhara Samhita sandhis* are also the meeting place of any two structures in the body such *sandhis* are held together by *sleshmak Kapha*. *Sleshmadhara* kala presents in all kind of joints, for supporting its function, just like the moves easily when its axle hole is lubricated with oil, similarly the joints moves freely, lubricate with *sleshma kapha*. Acharya Sushruta first divided the *sandhis* into two types.

Classification of *sandhis* based on range of movements
The *sandhis* are broadly classified into two groups.
सन्धयस्तु द्विविधाश्चेष्टावन्तः, स्थिराश्च ॥२४॥
शाखासु हन्वोः कट्यां च चेष्टावन्तस्तु सन्धयः।
शेषास्तु सन्धयः सर्वे विज्ञेया हि स्थिरा बुधैः ॥२५॥

Chestavanta or chesta yukta sandhis (Movable joints or Diarthroses)

These are the joints which permit free movements. These joints are more flexible and move in various directns with liberty. They found in *shakhas* (*extrimities*), *hanu* (jaw), and *kati*. *Chestavanta sandhis* are again two types Bahu-*chestayukta Sandhis* These joints allow wide range of movements. These types of joins are found in extrimities (elbow, knee, shoulder etc) and *hanu* (temporo-mandibular joint).

Alpa chestayukta sandhis

These are also movable joints but permits only a small range of movements. Such joints are found in vertebral column. *Sthira Sandhis* or *Achestayukta Sandhis* (Immovable joints) These are joints which do not permit movements and are stable. All the other joints apart from those explained in *chestavanta sandhis* are considered as *sthira sandhis.*

Classification of sandhi based on 'structure of joints Based on structure and shape of joints, *sandhids* are eight types. They are described below.

त एते सन्धयोऽष्टविधाः- कोरोलूखलसामुद्गप्रतरतुन्नसेवनीवायसतुण्डमण्डलशङ्खावर्ताः|

तेषामङ्गुलिमणिबन्धगुल्फजानुकूपरेषु कोराः सन्धयः, कक्षावङ्क्षणदशनेषूलूखलाः, अंसपीठगुदभगनितम्बेषु सामुद्गाः, ग्रीवापृष्ठवंशयोः प्रतराः, शिरःकटीकपालेषु तुन्नसेवन्यः, हन्वोरुभयतस्तु वायसतुण्डाः, कण्ठहृदयनेत्रक्लोमनाडीषु मण्डलाः, श्रोत्रशृङ्गाटकेषु शङ्खावर्ताः |

A. Kora Sandhi

These are in shape of hinges and are totally mobile in one direction while partially mobile in opposite direction. Example of such *sandhis* are seen in the joints of *anguli sandhi* (joints of fingers, inter-phalangeal joint), *manibandha sandhi* (wrista joint), *gulpha* sandhi (ankle joint), *janu sandhi* (knee joint) and *kurpara sandhi* (elbow joint). These *sandhis* are compared to hinge joints.

B. Ulukhala or *Udukhala Sandhi*

These are the joint which allow pestle and mortar type of movements. Here the head shaped end of one bone articulates with the socket or pit like surface provided in another bone so as to form a ball and socket type of joint. Examples of ulukhala sandhis are kaksha sandhi (shoulder joint), vakshan sandhi (hip joint), dashana sandhi (articulation of teeth in their socket). Ulukhala can be compared to the ball ana socket type of joint.

C. Samudga Sandhi

This type of joint are of box shaped or plate shaped (bowl). Examples of *samudga* sandhi are the joint found in *amsapeetha* (glenoid cavity of scapula), *guda* (coccygeal) and *Nitamba* (iliac) region. These *jonts* are compared to cavity joints.

D. Pratar Sandhi

These are just plain type of joints wherein one surface of one bone articulate with the other surface of another bone. Example of *pratar sandhi* can be found in the joints of *greeva vamsha* (dorsal or thorasic vertebrae) inter vertebral joint. These joints are copared to plain joint.

E. Tuna Sevani Sandhi

These joints are in the form of stitches or suture between two bones, i.e. one feels as if two bones heve been stitched with other. Example of tuna *sevani sandhi* can be found in the joints of *shiraha kapala* (suture of the skull), and *kati kapal* (suture joints of pelvic bones). These joints can be compared to sutural joint.

F. Vayasa Tunda Sandhi

This joint is in the shape of beak of a crow. Example of *vayasa tunda sandhi* can be found in the joints of *Hanu sandhi* (temporo-mandibular joint). these joint can be compared to crow beak joint.

G. Mandala Sandhi

These are round fixed and cartilaginous joints found in some structures of body. example of *mandala sandhi* can be found in *Kantha* (throat), *Klomanadi* (trachea)etc. these joints can be compared to the cartilaginous joint or annular joints.

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H. Shankhavarta Sandhi

These joints are in the form and shape of spiral windings of conch. Example of *sankhavarta sandhi* can be seen in the joints of the *srotra* (ear) and *sringataka* regions. These joints can be compared with the spiral and cartilaginous or membranous and fixed joints.

Number of joints in Whole body In our *Ayurved* classics different *Acharyas* have mentioned different no of *sandhi*. According to *Acharya Charak* in *Charak samhita sandhis* are 200, he only mentioned about no of *Asthi* sandhi, but didn‟t give description about features, characters, types and location of *Asthi sandhis.* According to *Acharya Sushruta*, *sandhis* are 210 in numbers, which are responsible for various movements. He gives description about features, characters, types and location of *Asthi sandhi*. The distribution is as follows.

In the shakha (extrimities)	68
In the Kostha (trunk)	59
In jatrurdhava (head & neck)	83
Total no of sandhis	210

Number of joints and their location *Acharya sushruta* and in *astang sangraha* described about features, characters, *sankhya* (210) and location of *asthi sandhies.* In modern science there are 360 joints in the body and proper description, situation & characters also present. So here we discuss about differentviews of different acharya about *asthi sandhi sharir shankhya*, types, location and its detail description and co- relative study with modern science.

Co-Relative study of the joint number with modern science: As *Ayurvedic* Classics, in modern Anatomy there may be some difference in number of joint. In modern design anatomy, *sthira sandhis* are called immovable joints and the *chesta yukta sandis* are called movable joints. Acharya Sushruta not only described the position of 210 *sandhis* but the name and exact position of those *sandhis* have not yet been described. Here we discuss about no of joints according to Acharya Sushruta & its brief co-relation with modern science.

II. DISCUSSION

Understanding joints is essential for medical science in addition to its anatomical and structural significance. The most prevalent lifestyle problems seen in clinical practice are joint disorders. Their frequency is steadily rising in tandem with evolution. In addition to offering good lubrication, *sandhis* are abodes of *Kapha*, primarily *Sleshmaka kapha*, which keeps them integrated and working. *Sleshmadhara kala*, which secretes *sleshma* and nurses sandhis, covers all kinds of *sandhis*. *Sandhis* are also *marmas*, crucial places, or sensitive or fragile structures that, if damaged, can result in death, or deformity if damaged or degenerated. *Acharye* says that there are two types of *Sushruta sandhies*. Synathrosis is immovable, whereas diathrosis is mobile. There are eight types of *sandhis* based on the shape and structure of the joints. Similar to the synovial joints described in *Sushruta Samhita*, the articular surface of the joint is lubricated by the synovial fluid released by the synovial membrane, which is principally in charge of preserving the joints' normal function. In different *ayuvedic samhita*‟s different views about *sandhies*. In *charak samhita* according to *Acharya charak shankhaya* of *ashthi sandhies* are 200 but he didn‟t give description about features, characters and location of *asthi sandhies*. *Acharya sushruta* and in *Astang sangraha* described about features, characters, *sankhya* (210) and location of *asthi sandhies.* In modern science there are 360 joints in the body and proper description characters also available. So here we discuss about different views of different *acharya* about *asthi sandhi sharir shankhya*, types, location and its detail description and corelative study with modern science. Like the *vedic* literature, in modern anatomies, the number of joints is the only the difference of opinion. They gave cartilaginous joints on the basis of they told the *tarunasthi*. Modern anatomy has different joints of different bones, but Acharya Sushruta has taken only one joint of many bones.

III. CONCLUSION

According to the numerous *Ayurvedic* classical literature, *sandhis* are places where two or more *Asthis* intersect. It is considered to be a mixture of two or more joint sowings, even in contemporary anatomy. Similar to *Ayurvedic* classics, there are still some questions over the number of joints in modern anatomy. The number of joints was 360 in modern science. This work outlined the many *Acharyas* perspectives on the *sandhis* and allowed for a conjunction with the joint described in contemporary anatomy. Following the explanation, the kind and placement of *Acharya Sushruta's* joints are nearly identical to those of modern anatomy, which divided joints into two categories: movable, or *chesta yukta sandhi*, and immovable, or *sthir sandhi*. Similar to a synovial joint, he wrestled it in eight different varieties once more. As a consequence, we discovered that *Acharya Sushruta's* description best fits the *sandhis* that other classics obtained. The *acharya sushruta's* description closely relates to contemporary science. Their types, location, characters and features of *sandhis* are closely matched with modern description, variations only in numbers, because *Acharya Sushruta* has taken only one joint of many bones.

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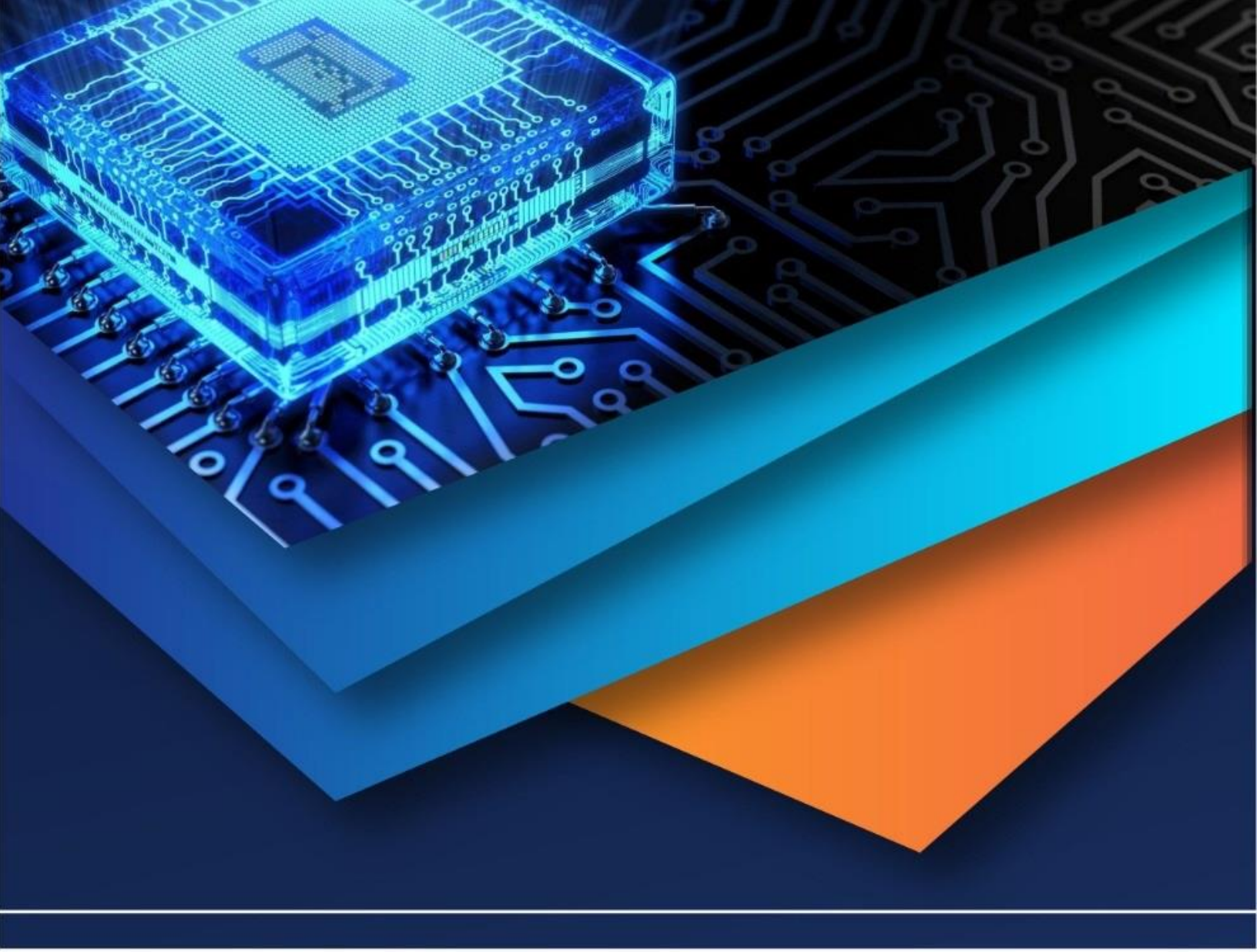

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